The Macdonald Journal

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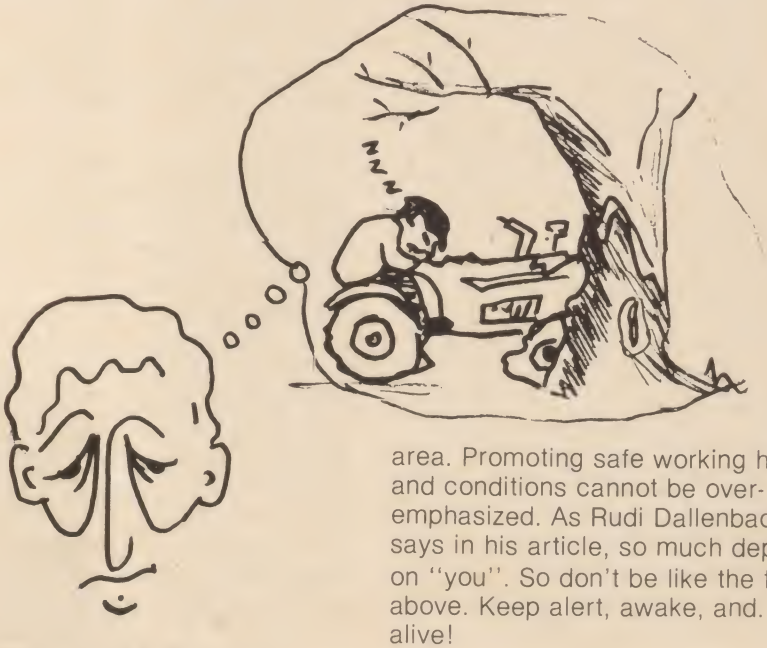
In This Issue

Cover: For a comprehensive review of the Sugarcane Feeds Centre project, located in Trinidad, may we suggest you turn to the Editorial on page 2 and the article on page 3.

urnal Jottings

e lead article this month, as in-ated by the cover, is international flavour. So is the Editorial, and we uld like to thank Dr. Hitschfeld for contribution. One of the research jects that I have been anxious to e appear in the Journal is in this ue. "Ear Tag Control of Livestock sts" will, I am certain, be read th great interest by both beef and iry men.

n Currie of the Diploma Program s been conducting a much-eded and appreciated one-man m safety campaign. He has at-nded meetings and seminars and velled to various regions in ebec to speak to farm groups. He s also co-ordinated the three safe-articles in this issue. I read



recently that a farm safety campaign is underway in the Richmond area. Promoting safe working habits and conditions cannot be over-emphasized. As Rudi Dallenbach says in his article, so much depends on "you". So don't be like the fellow above. Keep alert, awake, and. . . alive!

Hazel M. Clarke.

Editorial

SUGARCANE FEEDS CENTRE: A Rewarding Challenge

The appearance in this issue of Professor Eugene Donefer's article on the Sugarcane Feeds Centre in Trinidad offers the opportunity to reflect on the joys (and occasional tribulations) of this project.

McGill University has for years engaged in research and teaching activities in many parts of the world. The Caribbean area because of its closeness, because of the good relations we enjoy with our numerous alumni there, and not least because of its great beauty and charm, has seen a large share of such efforts. We are happy in particular to operate the Bellairs Institute in Barbados, for which we received facilities and a small endowment in the fifties.

But never, certainly within living memory, were we asked to engage in so substantial and important a managerial venture as the construction and initial operation of the Sugarcane Feeds Centre. From the beginning we knew, of course, that thanks to Gene Donefer we had the concept of how to raise beef and milk with sugarcane, and we were keen to give a commercial-scale demonstration thereof. We also had the expertise in soil management necessary to adapt poor land to raising crops. But carrying out major construction, purchasing large equipment, managing a sizable labour force, etc., at a distant site where we did not know the commercial and labour practices very well presented a major challenge which the University accepted only reluctantly and only because we saw no other good way of having this very promising venture go forward.

Naturally, there were some problems. Interesting technical, scientific, and economic problems are noted by Dr. Donefer. On the management side the most serious stemmed from several threatened interruptions in the cash flow, which were usually resolved only at the last minute before — or even after — stringent deadlines. But these problems — like the others — were always happily resolved, thanks to the intrinsic merits of the project, the good humour and helpful attitude of the Trinidad and Tobago authorities and of the University of the West Indies, and because of the forbearance and flexibility of our own administration.

Nevertheless, I would conclude that such large managerial ventures are not necessarily ideal for a university. I do not mean that we should not take risks, even big risks, in undertaking big tasks, but we should take risks on things that we can to some extent control. We should usually not be expected in our Research and Development work to gamble in major ways on our financial, political and managerial skills, and on our skills in labour relations, none of which are our primary business. The University was willing in this case to take its chances that preparatory work in St. Kitts and Barbados was valid and that our Faculty of Agriculture resources could be utilized. We should always be ready to take our chances on our experts and skills. We were able to overcome the problems in this case, and I suppose the final successful outcome justifies the risks that had been taken, and Dr. Donefer, the late Mr. Muirhead, Mr. Neckles, Mr. Conrad, and Dr. Broughton (to name only some of those most involved) deserve our profound thanks.

The Centre has not only demonstrated the feasibility of the production system but has also started to spread the word through visitors, workshops and articles to other parts of the Caribbean and elsewhere. Although the system developed at the Sugarcane Feeds Centre appears primarily suited for well organized, large-scale operations, which can be private, co-operative, or governmental, it involves a concept and techniques which are enormously promising for small-scale (peasant) farmers who will be around for a long time to come and will continue to make an important contribution to local food supplies. I think we may justly say that through this project a real contribution has been made to the perennial problem of how to add high quality foods to the diets of the often malnourished people of the tropics.

McGill University and notably our Macdonald Faculty of Agriculture are convinced of the worthiness of the above objectives. We are certain that we have a great opportunity, maybe an obligation, to work with Third World colleagues and friends at universities, laboratories, and on farms, to spread our knowledge and skills, as well as to increase and diversify them through such interaction for the benefit of everyone, including incidentally our students who are our primary responsibility.

W.F. Hitschfeld
Director, McGill International

Dr. Hitschfeld was Vice-Principal and Dean of the Faculty of Graduat Studies and Research during the instigation and much of the SFC project. As such, he played an important role on the McGill SFC Executive Committee.

In keeping with our policy of freedom of expression, the opinions expressed are those of the author and not necessarily of the Journal.

SUGARCANE FEEDS CENTRE

y Professor E. Donefer
Department of Animal Science

the May, 1978, issue of the Maconald Journal I wrote an article escribing the official opening of the UGARCANE FEEDS CENTRE (SFC) Trinidad and the involvement of IcGill University through the Maconald Campus Faculty of griculture. Now four years later, ith the McGill responsibilities for he project having ended, it is a ood opportunity to review what was ccomplished from the time of the stigation of the SFC to its present tuation as an operating agricultural roduction unit.

he concept of the SFC was an utgrowth of small-scale projects onducted from 1968 to 1974 in the aribbean in the islands of St. Kitts nd Barbados, where the possibility as investigated of feeding sugarane to cattle and sheep as their ajor ration component. Several lacdonald staff and students were volved in these projects, which emonstrated that sugarcane fed to vestock resulted in good liveweight ains and thus provided a use of the hole sugarcane plant as an alterative to sugar production.

the St. Kitts and Barbados procts the sugarcane was processed sing Canadian-developed chnology, which involved splitting e sugarcane stalk and separating e woody outside rind from the gar-rich fibrous internal portion rmed "Comfith" or sugarfith). The nd could be used for board anufacture and the sugarfith rinded stalk used for conventional gar factory extraction (to anufacture sugar) or fed directly to vestock as an energy-rich forage.

he Barbados Project (1969-74) was anced by the Canadian Internaonal Development Agency (CIDA) cooperation with the Government of Barbados. Due to the favourable preliminary results, CIDA became interested in extending the results to determine the practical applicability of the sugarcane feeding concept.

In 1974 CIDA requested McGill to prepare a report on a proposed Centre to be established in Trinidad in collaboration with the University of the West Indies (UWI) Faculty of Agriculture, in which the technical and economic feasibility of using sugarcane-derived livestock feeds would be demonstrated. The report submitted to CIDA in mid 1975 recommended the establishment of the SUGARCANE FEEDS CENTRE with a primary demonstration and training function. Sugarcane-derived feeds (canefeeds) can result as by-products of the sugar factory manufacturing process (i.e., molasses, bagasse) or can involve the direct use of the whole sugarcane plant. It was accepted that the major SFC emphasis should be on the whole plant utilization and that the simpler and less expensive processing method of chopping should be investigated in addition to the specific Canadian derinding technology used in previous projects.

In October, 1976, a contract was signed between CIDA and McGill University where McGill agreed to be the executing agency for the SFC establishment and operation for a five-year period. I was designated as Project Director and was largely replaced in my normal Macdonald research and teaching activities for the project duration. Because of the multi-disciplinary nature of the SFC, valuable contributions to its development have been made by many staff members from the Faculties of Agriculture of both McGill and UWI. A SFC office, established on the Macdonald Campus, was responsible for different project activities including ordering equipment and supplies and keeping accounts for reporting to CIDA on the funds spent in Canada and Trinidad. The total CIDA contribution was $5 million with the Government of Trinidad and Tobago contributing an additional $1 million.

The first Project Manager in Trinidad was George Muirhead, a Canadian with more than 20 years of experience in British Columbia in livestock extension who had also completed five years of overseas experience in Zambia and Mauritius prior to joining our staff. When George arrived in Trinidad in late 1976, the initial job was to transform the 150-acre (60 hectare) project site made available by the Trinidad Government to an operational centre. Our pre-project report submitted in 1975 did not anticipate the nature of the problem in terms of site preparation since we had assumed land of at least average productivity would be available. As an important part of the SFC concept was the growing, harvesting, and processing of sugarcane to support the intended livestock population, the first challenge was to prepare the site for planting. An initial survey conducted by Drs. Ahmad and Gumbs (UWI) confirmed the poor structure, drainage, and fertility characteristics of the soil, which were of high acidity and high aluminum content. The project site in early 1977 thus represented an area previously abandoned for agriculture purposes, with half of the area in forest growth. The question was whether project resources (financial and technical) should be diverted to land reclamation or if only the livestock aspects should be developed with sugarcane requirements met from outside purchases. As the poor soil type was

representative of much of the underutilized land in Trinidad and other tropical areas, the decision was made to go ahead and develop the project site for sugarcane production. An initial planning input was made by Dr. Warkentin of the Macdonald Renewable Resources Department (Soils) and the strategy for the major part of the SFC soil improvement program was provided by Dr. Broughton of the Macdonald Agricultural Engineering Department. Land was cleared and installations included a sub-surface drainage system and buried PVC pipe to be used with a travelling sprinkler for subsequent application of liquid manure resulting from the cattle operation. Initial heavy applications of lime and inorganic fertilizer were later supplemented with cattle manure as the major fertilizer source.

The overall success of the soil renovation program has been reflected in the average sugarcane yields obtained on the 94 acres (38 ha) of project land planted to sugarcane. In 1980 32 tonnes/acres (80 tonnes/ha) of fresh cane was produced, with a dry matter content of approximately 30 per cent, comparing favourably with cane yields on commercial lands in Trinidad. This illustrates the outstanding production characteristic of the sugarcane crop which yields annually about twice the dry matter of a North American-produced whole corn crop, with the cane having the other advantage of being a perennial with six to seven annual crops generally harvested before replanting.

Another aspect of the establishment of the SFC involved the design and construction of the buildings for animal housing, feed storage and processing, equipment maintenance and offices. The initial building planning contribution was by Dr. Ogilvie of the Macdonald Agricutural Engineering Department with the building construction under the supervision of Dev Duggal, a former Macdonald graduate student who was employed by the Trinidad and Tobago Ministry of Agriculture. In both land development and building construction aspects, Project Manager George Muirhead, under the difficult existing conditions, made it possible for SFC operational aspects to start in the second year of the project. In 1979, Floyd Neckles became Project Manager with George continuing in an advisory capacity. George Muirhead's death in 1980, after his return to Canada, was commemorated by a plaque placed in the SFC office building which recognized his outstanding contribution to the establishment and operation of the Centre.

At the time of its official opening and first Sugarcane Feeds Workshop, held in February, 1978, the Centre had become operational although land, crop, and construction activities were still incomplete.

The SFC livestock production system commenced in mid 1977 with the initiation of calf purchases from local farmers. The Trinidad cattle population is kept primarily for dairy production, with substantial imports of Holstein cattle from Canada and the United States made over the last several decades. The imported cattle have been crossbred to a limited extent to tropical-type (Zebu) cattle with the resultant population about 75 per cent Holstein and 25 per cent Zebu type. In Trinidad as in many areas specializing in milk production (including Quebec) male calves which offer a good potential source of veal or beef are generally *not well utilized*. The SFC livestock production system was thus based on the purchase of calves, averaging about a week of age, rearing them in individual cages on milk replacer for a five-week period, and after 10 weeks transferring them to pens where they were group fed sugarcane-based rations until market weights were reached.

Over a 4.5-year period, about 1,100 calves have been purchased and reared at SFC. A substantial amount of data has been collected on growth and feed intake characteristics as influenced by different types and levels of milk replacers, length of milk feeding periods, and different types of forage and grain mixtures. Overall calf mortality has averaged about 10 per cent, which is considerably lower than observed on Trinidad small-scale dairy farms. Over a 72-day period from purchase to transfer to group feeding, daily weight gains for a recent group of 135 calves have averaged 0.4 kg (0.8 lb) with final weights averaging 60 kg (132 lb).

The SFC system involves group feeding of cattle until reaching weights of 400 kg (900 lbs) when they are sold for beef in the case of steers, or in the case of heifers they are bred and sold to farmers as dairy herd replacements. The primary ration ingredient has been fresh chopped mature sugarcane which is harvested on a daily basis. As the sugarcane plant is characterized by low protein, mineral, and vitamin contents, adequate nutrients must be supplemented in order to meet animal requirements.

Over the past several years, different feeding programs have been evaluated in order to determine the effect of various factors on cattle liveweight gains and economic performance. At any particular time, three to four different feeding programs will be conducted using the 500-600 cattle population. Factors evaluated include level of sugarcane in the ration (varying from 77 down to 20 per cent on a dry basis), the effect of different types and levels of protein supplementation, and the feeding value of ensiled (fermented) sugarcane used as a form of preservation. Cattle gains have been observed to be primarily a function of level of sugarcane in the ration with cattle gaining about 0.7 kg (1.5 lb) at a 70-75 per cent ration level and 0.8 to 1.3 kg (1.8 to 3.0 lb) daily when cane ranged from 40 to 20 per cent of the ration. This inverse relationship is one that is commonly found in beef cattle production in North America where ration forage level is negatively related to liveweight gains. Although higher gains are achieved with lower

rage (cane) levels, the problem is at the non-forage ration component usually consists of grains like orn which are high priced or of mited availability for livestock feed Trinidad and other developing ountries.

t SFC, molasses has been used to eplace a considerable portion of ne ration grain content and current tudies are utilizing broken rice as a y-product of the rice industry, as a rain source. Economic studies indicate that high sugarcane usage is nore economical than using high rain levels, even with reduced eight gains because of the much wer cost of producing sugarcane cally. The use of higher forage-low rain rations also results in a lean pe of beef much more suited to cal market conditions. Over a two-ear period, 464 steers were sold by

SFC calf-rearing unit

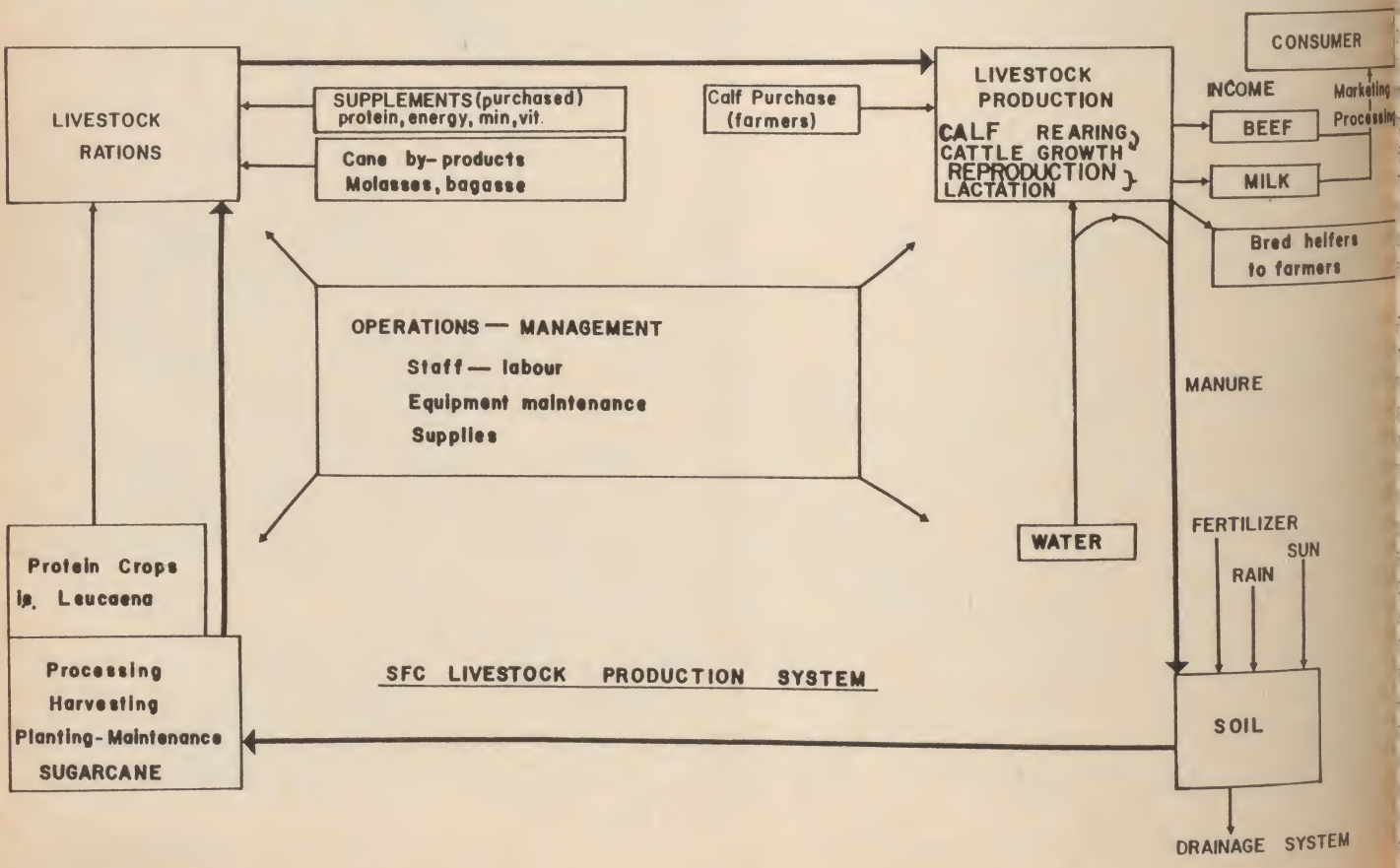
oyd Neckles, SFC Project Manager, demonstrating sugarcane processing equipment to a group agriculture students from the University of the West Indies (UWI).

SFC for beef representing a total market beef weight of 87,900 kg (193,750 lb). This beef has been marketed in supermarkets and smaller stores and has made a major impact on the Trinidad market since over 90 per cent of the local beef requirement is usually imported (from New Zealand, the U.S., and Canada).

An early addition to the cattle growing program was the purchase of female calves to be raised on the SFC system. Of the 170 calves purchased up until September, 1981, 66 have reached a reproductive stage, with 30 confirmed pregnant animals being sold to local dairy farmers. The advantage of the SFC feeding system is to reduce the age of calving, with a goal of heifers to calve at 27 months, which is a year or more less than normally achieved in Trinidad. If such results could be extended to the local dairy industry, the substantial increase in reproductive efficiency would result in higher levels of domestic milk production. A small herd of up to 20 milking cows has been maintained at the SFC with some cows currently into their third lactation. The cows are fed chopped sugarcane at a 60 per cent level supplemented with a concentrate mixture to supply required nutrients and have averaged about 9 kg (20 lb) of milk daily over the lactation period. Although this production level is low by North American standards, it is quite favourable compared to that generally achieved in the tropics. Due to a high price recently set for milk by the government, dairy systems using sugarcane have a good economic potential. Dr. Block of the Macdonald Department of Animal Science has been involved in setting up feeding trials to determine the full potential of the cows to produce milk under Trinidad conditions.

In Figure 1 the overall SFC livestock production system illustrates the necessary multidisciplinary nature of the operation. Although research trials have been superimposed upon different parts of the system in order to determine the effect of various factors or inputs on production levels, the Centre has basically operated to develop and demonstrate a commercial agricultural prototype. As crops must be harvested and cattle fed on a daily basis throughout the year, operational considerations always have first priority.

Several operational and technical problems have been identified and attempts made to correct them. A major limiting factor is difficulty of harvesting sugarcane during the rainy season, which in Trinidad occurs about three quarters of the year (May to December). In addition to field management problems on the water-logged soils, the feeding quality of the cane also decreases in the rainy season due to reduced sugar levels. An SFC program underway to correct this difficulty involves the use of sugarcane harvested in the dry season at peak feeding value but preserved for wet season feeding by ensiling. Dr. Baker of the Macdonald Department of Agricultural Chemistry has been investigating the use of silage additives to further preserve cane feeding value.



WI students learning about cattle growth program

nother limiting factor is related to
ie low protein content of cane and
ie need of supplementation with
xpensive sources of imported pro-
in (soybean meal). A preliminary
FC program, established by Dr.
hillip of the Macdonald Department
Animal Science, has involved
eding studies with a locally grown
gume (leucaena) of high protein
ontent, with initial results indicating
at the plant can contribute a
bstantial portion of the needed
upplemental protein.

ie SFC economic analysis pro-
am has consisted of several com-
onents. Resource requirements
ich as labour and equipment for all
spects of the crop and animal
stem have been measured to
etermine the costs of each system
omponent. Gross margin analysis
as been conducted for the various
eding trials to determine the
venue obtained (meat, milk) minus
e cost of feed inputs. The most
omprehensive economic analysis
as been conducted by Bob Conrad,
ssistant Project Director, who has
nployed the technique of
mulating a commercial beef pro-
uction system using SFC-generated
ata and calculating internal rates of return covering a 20-year operating period. The economic results indicate that feedlot beef production in Trinidad using sugarcane-based rations is commercially viable at scales of operation of over 500 head of cattle, this due to the costs of the relatively capital intensive structures and equipment required. These results are qualified in that they are based on price relationships existing at a specific time and are based on technical assumptions based on results from SFC feeding trials during the last year of the project. As further technical developments should serve to increase the level and reduce costs of production, improved commercial viability should provide stimulation to increase local production.

The SFC has operated a small extension program with a selected group of small-scale dairy farmers to determine actual farmers' interest in using sugarcane as a feed. The results have indicated that since these farms are operated to an increasing extent on a part time basis with low levels of management and production, the potential for innovation is limited. An informal extension program has operated through visits of individuals and groups to the Centre. Over the last two-year period, over 1,300 visitors were recorded representing people identified as 60 per cent local, 30 per cent regional (Caribbean), and 10 per cent international. The local visitors have been farmers' groups organized through the Government Extension Service, University students (UWI), and high school students taking vocational agriculture courses.

As a result of these visits, there has been an indication that many farmers are interested in introducing innovations on their farms. This interest is based on observing different SFC management practices, some of which involve sugarcane feeding. The actual demonstration and training impact of the SFC on local and regional livestock production will take some time to develop. The three Sugarcane Feed Workshops held at SFC involved over 100 participants each time, with the majority of the 12 Commonwealth Caribbean countries represented.

Although executed by a foreign-based University (McGill) and as a result of a deliberate policy, all managerial, technical, and operational SFC staff in Trinidad are, and have been, Trinidad residents (with the exception of George Muirhead, and an agricultural engineer employed during the final project year).

As of October, 1981, all physical and capital assets of the Centre became the property of the Government of Trinidad and Tobago, who will continue the SFC operation, including all necessary funding, for an additional three-year period. It is of interest that during this next SFC phase, operations will be continued according to the previous overall objectives, utilizing the existing organizational and managerial procedures and local staff. Some measure of the McGill success as executing agent in the initial five-year period will be the growth and continuing contributions of the SUGARCANE FEEDS CENTRE under its local direction and management.

Ear Tag Control of Livestock Pests

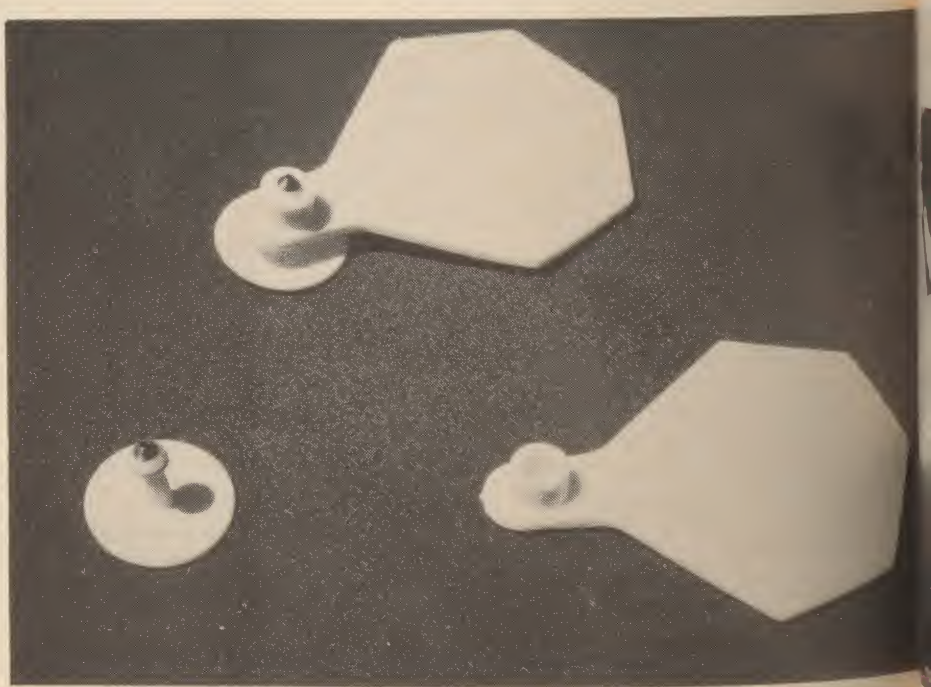
by Professor David J. Lewis, Department of Entomology and Professor Elliot Block, Department of Animal Science

In the past few years insecticide-impregnated cattle ear tags have been extremely effective in controlling several pests of livestock. These include horn flies, face flies, several species of ticks, and, to a lesser extent, house flies, and stable flies. Insecticidal cattle ear tags have also protected test animals from infestation by the screwworm. These tags may be used on both beef and dairy cattle.

The insecticidal cattle ear tag is a plastic ear tag impregnated with an insecticide and structurally resembles typical cattle identification tags. Most tags are impregnated with permethrin, fenvalerate or tetrachlorvinphos, but decamethrin, dichlorvos, and stirofos have also been used. The tag is easily attached to the ear by using cattle tagging pliers, and it is usually positioned slightly below the tip of the ear such that the tag hangs below the ear. Once the tag is in position and as the animal licks itself or comes into contact with another animal, the tag comes into contact with the hair thereby removing a thin layer of insecticide (approximately 2-3 mg/day). Each time a layer of insecticide is removed, a new active surface is exposed. This action continues for the life of the tag and does not appear to be affected by dampness or rain. The area of the body touched by the tag becomes lethal to pests which land or crawl onto that area.

In the summer of 1981 a tetrachlorvinphos-impregnated ear tag was evaluated on the Macdonald Farm. Two groups of cattle (mostly Holstein but also Ayrshire) were used in the evaluation. Cows of the tagged group each had one tag in the right ear; the control group, without tags, was on separate pasture. Weekly fly counts on both groups showed that there were four main pests: horn flies (75.6 per cent), stable flies (15.0 per cent), house flies (5.2 per cent), and face flies (3.1 per cent). The remaining 1.1 per cent consisted of mosquitoes, horse flies, and deer flies. During the summer there was an overall fly reduction of 88.5 per cent on the tagged animals. While there was a reduction in numbers of all the component species, the reductions were not uniform. The most significant reduction (95.9 per cent) occurred in the horn flies; the face flies, house flies, and stable flies were reduced 84.3 per cent, 65.9 per cent and 60.3 per cent respectively. The tags provided excellent control for a 14-week period (early June-mid September). During the 15th week of the evaluation the number of flies on the tagged animals rose by 573.3 per cent over the previous week, indicating a loss of insecticidal activity.

Similar studies with different ear tags in other regions of Canada and the United States have shown that horn flies can also be successfully controlled when only one of every four animals is tagged. In some of those studies longer or better con-



Assembled and disassembled ear tags.

orn flies on the loin area of a cow.

Stable flies and house flies on legs.

olsteins with ear tags.

trol of flies was affected by increasing the number of tags (i.e., two tags on each animal — one in each ear). However, two tags on one third of the cows in a herd has been almost as effective as two tags on every cow. In Alberta the daily weight gain of pastured yearlings can be reduced as much as 30 per cent due to horn flies. Also, calves weaned from unprotected mothers were considerably lighter than those whose mothers had been protected from horn flies. Control of the face fly in some areas has been associated with a significant reduction of pinkeye. Although ear tags can be used for all animals in a herd (from yearlings to bulls), at least some manufacturers do not recommend tagging calves less than five or six months of age due to possible ear deformity. In all studies, including the one conducted on the Macdonald Farm, there has been very little evidence of necrosis or skin irritation of the ear area around the tag. Occasionally an animal loses its tag. In earlier studies this appeared to be a fault in the tag design; however, in more recent studies it seems to be a result of cows rubbing their heads against fence posts, trees, or each other.

Insecticide-impregnated ear tags do not provide total pest control, but they show considerable promise. At present, they offer excellent control of horn fly and a substantial reduction of the face fly on pastured cattle. The use of such tags (which are easily applied, replaced, and removed) may reduce the frequency of coralling for spray applications and may reduce weight losses and production losses.

Learning to LIVE with Poisonous Gases

by Jim Currie
Assistant Director, Farm Practice Diploma Program

February 22, 1982
Ste. Augustin, Quebec. Three young men killed while working above a manure pit of a dairy barn.

Expected cause: *Hydrogen sulphide gas — coroner's inquest in progress.*

September 14, 1977
Gananoque, Ontario. Three men die when overcome by silo gas.

Both of the above instances graphically illustrate two dangerous situations on many modern farms: the production of poisonous gases by stored material. Certainly many farms do not have liquid manure pits, but any manure storage area can build up toxic gases under certain conditions. Much more common is the tower silo, obvious on so many farms around the country. It is vital to know the why's of lethal gas development in order to avoid the danger of becoming the next tragic headline.

In general terms, a foreign gas of any kind tends to tie-up or exclude oxygen from normal air. Under certain circumstances and if it is in a strong enough concentration, any gas that reduces the available oxygen can become lethal.

There are many hazardous gases that occur on the farm but the worst two are hydrogen sulphide (H_2S) commonly called "manure gas", and nitrogen dioxide (NO_2) or "silo gas".

Liquid manure systems are becoming much more common as farmers try to economize on manpower by automation. The hog industry converted to liquid first, but now more dairy and beef farmers are considering this option when building new barns. As with any new techniques, there are definite benefits for those who learn how to use them properly. With these benefits come the inevitable risks such as the number and types of hazardous gases produced by the natural breakdown of manure in anaerobic conditions. Gases such as methane and carbon dioxide, both toxic in high enough concentrations, are produced. However, hydrogen sulphide, H_2S, has acquired the common name manure gas because it is by far the most dangerous of all the manure by-products. Hydrogen sulphide is a clear, colourless gas with a characteristic rotten egg odour at low concentrations. Reliance on this odour as a hazard warning can be deadly since the gas at concentrations over 150 ppm overpowers the sense of smell so the person can no longer detect its presence. Similarly, the loss of detectable odour while in the barn doesn't mean that there is no more danger; it could mean the exact opposite — that the gas concentration has increased and is approaching more lethal levels.

There are two main danger periods with manure gas. Since H_2S is heavier than air, it accumulates just above the surface in the tank. As the tank fills, the gas can be forced above the level of the floor, thus affecting livestock, short children and, ultimately, taller people. This would be especially true in barns with poor ventilation, but even under good conditions the weight of this gas makes it more difficult to move, leaving concentrations in pockets in the barn.

The greatest danger occurs during agitation since far more gas is released at this time. The reaction is similar to that of a soft drink when shaken. The increase in gas must go somewhere and if not enough space is available in the pit, it will be forced up into the barn.

When working with a liquid manure system the recommended precautions are as follows:

1. Under no circumstances should anyone enter a liquid manure pit — even if the pit is empty — without wearing a self-contained breathing apparatus. Use a life line that is connected to someone outside the danger area.
2. Never allow the manure pit to fill completely. Allow one or two feet of air space to accommodate concentrations of gas.
3. If possible, lower the level of liquid manure in the storage facility before commencing agitation. This will further reduce the possibility of gas being forced above floor level.
4. Keep the agitator below the liquid surface. Gas will be released in greater volumes if vigorous surface agitation occurs.
5. Provide strong ventilation during pumping and agitation. The building interior should be off limits to people and, if possible, animals should be evacuated.
6. Because of the dangers presented by the agitation and pumping operations, these procedures should involve two people, connected by a life line, with one person always outside of the danger area.
7. Consult with your physician if you have been exposed to hydrogen sulphide in concentrations severe enough to cause irritation to the respiratory tract.

Silo Gases

Silos are much more common in Quebec than are manure pits. They are accepted as a tremendous asset by most farmers, but, again, there are drawbacks. The worst of these is "silo gas".

Silo gas or nitrogen dioxide is formed when the nitric oxide released during fermentation combines with free oxygen in the silo. Nitric oxide is toxic but normally combines quickly enough that it is not a problem. Unfortunately the new product, nitrogen dioxide, is even more

ic. Its effect at higher concentrations has been compared to being by a bullet. When inhaled the gas acts with water in the respiratory ct to form nitric and nitrous acids. ese in turn react with natural ali salts in the tract to form rates and nitrites causing irritation d chemical pneumonia. Exposure heavy concentrations can result death within seconds. Lesser concntrations may result in extensive g damage with the strong ssibility of death hours later due pneumonia. **FOR THIS REASON, YOU THINK YOU HAVE BEEN XPOSED, GET TO A DOCTOR UICKLY.**

reduce the risk of silo gas proction a farmer must consider his al management plan. By following e basic rules for proper crop proction many of the problems will automatically eliminated. The use the most suitable variety of corn the area reduces the risk of rvesting an immature crop or of ving the plants under stress from vironmental factors during the owing season. This is also a factor en choosing disease and pest sistant varieties.

e proper use of soil tests and lanced fertilizers allows the crop grow without stress. It also duces the excess nitrogen that ght occur in the soil from over erzation. This will also save money the long run.

viously, proper weed control is sential to maximize crop produc-n. An off-shoot of this is that free rates will also be reduced since eeds add stress to the growing op. As Table I indicates, weeds so contain more nitrates than even rn so any reduction in weeds eans less total nitrates in the ensil- crop.

ABLE I. Maximum Percentage of Dry Matter as Nitrate (NO_3)

eeds	7.5
rn, Sudan Grass, Sorghums	5.0
ts, Wheat, Barley, Rye	4.0
ome, Orchardgrass, Timothy	3.0
alfa, Red Clover	1.0

rvesting methods can also affect e level of nitrates in the final silage. It has been found that after a period of rain the plant takes up more nitrogen than normal. This, in turn, causes a bit of lag time before the nitrates are metabolized to proteins. So by not rushing off to the fields too quickly after a rainfall, time is allowed for the plant to recover its normal nitrate level.

When frost kills the outer leaves of the corn plant, photosynthesis and protein production ceases but the unaffected root will continue to pump up nitrates into the stalk. In this case the crop should be cut as soon as possible to stop this storing.

In either of these cases the build up of nitrates is greatest in the lower stalks so by cutting higher above the ground the danger is reduced. This has the added effect of turning more organic matter back to the soil and not significantly reducing total yield. Finally, before harvest starts, the distributor in the silo should be adjusted properly and then checked to make sure it is not filling the silo off level. This will not reduce the nitrates, but it will eliminate the need to enter the silo to level the chopped material. Silo gas, being heavier than air, will flow to the lowest point in the silo. By having a level surface it allows any gas formed to flow toward the chute, down it and out through the properly ventilated silo room at the bottom.

At present there is no safe test for silo gas. The only signs are reddish yellow fumes and a bleach-like odour. Therefore, once silo filling has started, it is safest to assume that silo gas is present and act accordingly. Ordinarily the danger period only lasts until about three weeks after the last silage is blown in. If at all possible, no one should enter the silo until this danger period is passed. The doors to the silo room should be locked to keep children and visitors out and a warning sign placed on the door. If it is necessary to enter the silo, a self-contained breathing apparatus, not just a gas mask, must be worn. In some cases, running the blower will help to eliminate the gas, but if the level of the silage is more than 20 feet below the blower, this is not effective.

In brief, contrary to popular belief, silo gas does not start forming soon after the chopped silage is blown up the pipe. It is the indirect result of a succession of activities and factors that may have been developing for years. It is a direct result of an accumulation of excess nitrates in the ensiled crop. These excess nitrates, in turn, are the result of either poor management practices or unfavourable weather conditions. Under normal conditions nitrates that are taken up by plant roots are readily changed to proteins. However, any factor that interferes with photosynthesis, interferes with this transformation, and the nitrates are stores as free nitrates. These factors include: improper balance of fertilizers, or over fertilizing; poor weed and disease control; poor growing season, prolonged cool or drought conditions; and plant damage due to hail, frost, or other physical events. Observe and take note of what happens during the growing season; it may point toward upcoming dangers.

Obviously it will be necessary to enter the silo at some point. You should always let another person know when you go into a silo. When entering for the first time after harvesting, it is best to be attached by a life line to someone outside the danger area. The only way to avoid the risk of silo gas is to be prepared for it. Since it works so fast, it is impossible to correct a wrong guess.

If a person is affected by silo gas, even the slightest irritation or coughing, he should be taken to a doctor **immediately.** Many farmers have died in their sleep due to the pneumonia caused by this gas.

In Ontario all silo manufacturers are required to distribute an operator's manual with new silos. There is a guide to safe silo practices included. If it is possible to obtain one of these books, it would be well worth the effort. There are two fact sheets produced by the Ontario Farm Safety Association concerning silo and manure gases. Copies of these are available by sending a self-addressed, stamped envelope to: Mr. Jim Currie, Diploma Program, Box 335, Macdonald Campus, 21,111 Lakeshore Road, Ste. Anne de Bellevue, Que. H9X 1C0.

Safety with Farm Chemicals

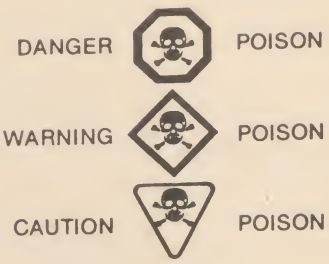
by Gerry Cornell
Diploma II, Edited by
Jim Currie, Assistant
Director, Farm Practice
Diploma Program

Modern agriculture requires the use of various chemicals. Herbicides are needed for large scale weed control, insecticides and pesticides for insect and pest control. Whether the chemicals are helpful or harmful depends greatly on the user's ability to handle them properly. When used as directed, chemicals are safe and effective. Used improperly, they can be injurious to man, animals, and plants. Due to the nature of these farm chemicals, herbicides, insecticides, pesticides, and so on, many precautionary steps should be taken to avoid poisoning:

—keep chemicals out of the reach of children;
—avoid breathing of chemical sprays or dust;
—wear recommended protective clothing and equipment;
—avoid swallowing, splashing in eyes, or spilling chemicals on parts of the body or clothing;
—know the appropriate antidote to use if necessary.

The most important point of all is to read and to follow all directions on the chemical label prior to the application of the farm chemical. The label, by law, tells you the following:

—the chemical group and chemical name as well as the trade name;
—the concentration of the active ingredients in the product;
—the protective measures to be taken, including the correct type of respirator if required;
—the recommended uses and rates of application;
—the correct handling, mixing, and loading procedures;
—the first aid treatment;
—the storage of the chemical so that it does not endanger humans or livestock;
—the disposal of the chemical container so that it does not contaminate water or leave illegal residues;
—the toxicity and poisoning symbols are as follows:



People using farm chemicals, especially insecticides and pesticides since they are formulated to kill, should be provided with the necessary protective clothing and equipment which should be kept in good condition. Suitable and separate accommodation for keeping protective clothing and equipment should be made available. The risk is reduced through the availability of washing facilities including clean water, soap, and towels. Care should be taken to ensure that food and drink is free from contamination by farm chemicals. Of course, protective clothing and equipment should be washed and cleaned after exposure to farm chemicals.

People using farm chemicals should not eat, drink, or smoke unless they have removed their protective clothing, have washed their hands and face, rinsed out their mouth, and left the area in which they might be affected by farm chemicals.

Respirators and dust masks should be cleaned and ventilated at the close of each day's operations. The respirator cartridges should be replaced if any chemical smell is detected while in use and in all cases they should be replaced according to the manufacturer's recommendations and specifications.

When transporting farm chemicals, consideration should be given to preventing spillage of the chemicals and transportation should take place only in suitable vehicles such as pick-up trucks. This insures protection to the driver and other users of the vehicle.

Seed treatment in the form of fungicide treatment and inoculation is common place to many large seed producers. Many legumes need inoculation with the proper symbiotic bacteria. Other seed, especially certain grasses, need to be treated with a fungicide to control disease.

Seed treatment can be quite dangerous and adequate protective measures including ventilation should be taken, even when the process takes place outdoors. The surplus treated seed should in no circumstances be fed to humans or to animals but should be destroyed in such a manner as to prevent human and animal contact with the residue or the smoke.

Farm chemicals may be corrosive, flammable, or toxic, and thus the chemicals should be handled and used only by persons who have been thoroughly instructed in their use. For example, insecticides which contain chlorinated hydrocarbons are more than likely highly toxic and affect the central nervous system, the kidneys, and the liver.

Pesticides, insecticides, or any farm chemical should not be entrusted to persons who, because of immaturity, mental illness, intoxication, or drug usage, might cause danger to themselves or other persons. For obvious reasons, pregnant women should not be employed to work with hazardous chemicals.

Unwanted chemicals and empty containers or bottles pose a problem for disposal. The best present solution is to have your own on farm chemical dumping and burial site. It should be at least 18 inches below the soil surface and six feet above the water table. Empty containers do contain residues and can be burned in such a way that persons cannot be endangered by the smoke. Plan your fire so that poisonous smoke can't drift towards livestock or buildings and bury the

(Continued on page 17)

The Family Farm

Published in the interests of the farmers of the province by the Quebec Department of Agriculture.

NE HARVESTS WHAT ONE AS SOWN

e primary objective of a grain pro-cer is no different from that of a lk producer or a beef producer: it to increase as much as possible e value of the inputs by seeking a aximum yield.

cording to Daniel Chez, rologist-plant pathologist of the ant Production Service, the height the grain heap at harvest pends on the number of plants r unit of surface, the number of eds per head, and the weight of grain. It is the product of these ee components which determines yield.

ere are many constraints which event the producer from obtaining maximum yield permissible for species he cultivates. Among se constraints, some of them are ficult to control such as climate d the nature of the soil, whereas ers which are related to crop nagement depend directly on the oducer.

study of the different elements ich have an effect on the growth cereals will bring out the most ourable conditions for obtaining od yields. First, we will discuss mate, the soil, the previous crops, d the choice of seed, and later we l talk of the various steps in tivation from soil preparation to harvest itself.

reals: Cool Climate Plants

matic conditions have con-erable influence on all plant pro-ction. Even if it is an element of nagement which can be influenc-by the producer, it is, never-less, a fact that the climate in this region will be the deciding factor as to whether or not there is a possibility of growing one species rather than another.

Cereals are plants which prefer cool climates; they grow well in most of the Quebel regions. Among the spring cereals, barley is the species which has the shortest growing season. It is followed by oats and wheat as indicated in the following table.

Table 1. **Growth period of the main cereal cultivars**

Oats		Barley		Wheat	
Cultivar	**Growth (days)**	**Cultivar**	**Growth (days)**	**Cultivar**	**Growth (days)**
Manic	97	Bruce	88	Laval 19	106
Laurent	95	Laurier	90	Opal	104
Oxford	98	Loyola	89	Concorde	105
Alma	95	Bonanza	89	Ankra	104
Scott	95	Conquest	88	Glenlea	101
Yamaska	94			Sinton	101
Dorval	97			Neepawa	99
Garry	96				

If the climate is a major constraint to the production of a cereal, one must not choose a species or a variety which is so late to such an extent that even if it has the best yield potential, it will not be able to reach maturity.

A Drained and Fertile Soil

Generally, cereals do well on heavy soils such as clay loams or clays under the condition that these be well drained. No cereal can grow normally in a soil which drains poorly in the spring.

In a sandy loam it is preferable to plant barley rather than wheat or oats. That species grows better than the others with the storage of water which is more frequent in light soils; on the other hand, it is more sensitive to soil acidity. Oats grow well in acid soil but grow even better if the pH is higher than 6.5; the same things is true for wheat. Consequently, the pH is one of the elements of the soil which one always tries to improve.

Soil analyses indicate its content in phosphorus and potassium. The soils that are richer in these two elements should be used for cereal production if one wishes to obtain maximum yields.

The Previous Crop is Important

In a good production plan, one must always plant the crops in an order which is the most favourable. The best previous crops are certainly those in which a good weed control program has been practiced and which leave the soil rich in fertility and with a good structure. These ideal conditions are sometimes present after a crop of sugar beets, a well-maintained legume, or corn. Soil which has been cultivated in previous years is preferable to an old pasture. The main inconveniences of the latter are the weeds which will have grown even before the cereal starts to point out. Strong competition will result and choking of the cereal in the case of couch grass. Barley is the worst competitor for the weeds. Consequently, it must have a special previous crop. It is possible to reduce the ef-

fect of weeds by good use of herbicides in the spring and a couch grass program in the fall.

In addition to weeds, one must add poor germination and growth on land that was previously in pasture because of a soil structure which is not favourable to good germination and because of a poor utilization of the fertilization. A good part of the fertilizers will be used to decompose the soil organic matter; this will result in the liberation of nitrogen in the summer which is more favourable to lodging than to a good filling of the grain.

In summary, when a decision is taken to grow cereals in an old pasture, the producer cannot expect to obtain a maximum yield the first year, and it is probably with oats or wheat that he will obtain the most success.

Certified and Adapted Seed

"One harvests what one has sown". This is an expression which really gets its true meaning here. Indeed, if the producer plants seed which germinates poorly, he will never obtain good results, even under the best conditions of cultivation. This does not mean either that buying certified seed will guarantee a good yield: in addition, the total management must be sufficiently good.

The buying of seed must be done in the fall for the following season if the cereal producer wishes to obtain the variety that is the most adaptable. Certain varieties are more demanding than others and the criteria based on yield potential must not be the only consideration. For the first year of production on an old pasture, it is preferable to use a hardier variety which will tolerate weeds better in difficult soil conditions even if theoretically this variety yields less than others which are suggested by the salesman.

Soil Preparation Begins at the End of the Summer

After having selected a variety and the field where it will be sown, the producer will start working the soil at the end of the summer by destroying couch grass if need be. This destruction can be carried out mechanically. The rhizomes have to be exposed to the sum after having been taken out of the soil with a tooth harrow, not a disc harrow — the latter does not pull out the rhizomes but cuts them up thus multiplying the couch grass hills even more. The destruction can also be carried out with the help of a herbicide containing glyphosate.

The next operation is fall ploughing. It is probably the most important cultivation operation; it improves the structure of the soil, its water reserves, and its microbial life; ploughing is the best way of controlling weeds. Of course, this operation will be even more efficient if drainage is good. If the soil is heavy or if there is an addition of lime, fall harrowing is recommended. Liming can also be carried out in the spring at the same time as the application of fertilizers; however, in order not to delay the planting, it is preferable to limit the number of spring operations.

Fertilization must compensate for the removal by the crop of elements which are expressed in kg per 100 kg of crop:

		N Nitrogen	P_2O_5 Phosphorus	K_2 Potash
Oats	grain	1.84	0.74	0.55
	straw	0.62	0.37	2.00
Barley	grain	1.82	0.78	0.52
	straw	0.75	0.25	1.50
Wheat	grain	2.08	1.07	0.67
	straw	0.67	0.16	1.17

A good part of the fertilizer which is added is retained by the soil and is not available to the plant. The addition of phosphorus and potash, therefore, must take into account the current soil fertility, whereas that of nitrogen will be related to what remains from the previous crop and the quality of soil organic matter that can be made available.

The quantity which is added must be in relation to the yield expected; however, in practice, it is felt that one must have at least 60 N/ha for oats and barley and 90 N/ha for wheat. These figues are indications only; good nitrogen fertilization must be determined in relation to the nitrogen balance in the soil in order to make sure the needs of the crop are covered.

Adjust before Seeding

Seeding is a major operation in the success of cereal production and the producer has complete control. As soon as the machinery can go on the land without risk of breaking its structure by compaction, it is time to seed. The date of seeding varies with the region, the drainage, and the type of soil, and it should not occur after mid May. Seedings at the end of May and early June will never give good yields. It has been demonstrated many times that early seeding permits better yields and a better quality of grain, less lodging, less disease, and an earlier crop obtained under good conditions.

The rate of seeding is in relation to the objective in mind. Theoretically the more seeds we plant the more will emerge and thus the bigger the crop. This reasoning, all too often applied, is not always exact because too much can be as harmful as too little.

One must aim at obtaining a certain number of seedlings at emergence. The objective will vary according to the conditions which are more or less favourable to tillering but should be about 300/m².

Calculation of number of seeds per m²

Assuming that the seed will germinate at 85 per cent (which represents the minimum norm of certified seed, one must always add 15 per cent more than the determined objective:

300 + (15% of 300) = 345 seeds/m²

Calculation of weight per 1,000 seeds

If the producer does not know the weight per 1,000 seeds of the seed he has bought, he can calculate it. In order to do so, he counts 10 heaps of 100 seeds each and weighs them with a small kitchen scale which can read to one gram

Calculation of weight of seeds per m²

From the weight of seed, it is easy

determine the quantity to seed in
na. If 1,000 seeds weigh 32
ms, for example, how much will
seeds weigh?

$\frac{\text{g} \times 345}{1{,}000}$ = 11 g: the weight of
d to plant per 1 m².

lculation of weight of seed hectare

000 m²
g x 10,000 = 110,000 g = 110 kg/ha

owing that to obtain 300 seedl-
s/m² in his field, 110/ kg/ha must
seeded, the producer will
brate a seed drill to assure that
quantity will be distributed. After
ing adjusted the seed drill
ording to the instruction from the
nufacturer, the producer will ad-
it, checking to see if the number
eeds distributed on a one metre
ance correspond to the figure
ained in multiplying the quantity
eeds to plant by the spread be-
en the rows of the seed drill:

number of seeds times the
ead between the furrow openers
ne seed drill equals the number
eeds to plant per metre.

refore, in our example there
uld be:

45 seeds x 0.18 M = 62.10.
refore 62 seeds per metre if the
d drill produces rows spaced
m (18 cm) and

345 seeds x 0.15 m = 51.75.
Therefore, 52 seeds per metre if the seed drill produces rows spaced 0.15 m (15 cm).
These very simple calculations will probably be included in the next CPVQ guide in the following form:
The seed drill being adjusted, one must also adjust for depth. Cereals should never be planted deeper than three centimetres. Otherwise the emergence is irregular, slowed down, and reduced. In addition, the seeds and seedlings are more sensitive to damping off diseases. The plants tiller less and have a tendency to lodge. The depth of seeding is adjusted by doing a few metres on the field and not on the road. In the field the soil must be loose on the surface; also the instruments have a tendency to sink a few additional centimetres which is an important consideration in the adjustement of the depth of seeding.

Finally, it is advisable to have the seed drill followed by a corrugated roller of the Brillon type. Rolling will improve germination and emergence while levelling off the land which will facilitate the harvest.

Spread between the furrow openers in the seed drill (cm)	Number of plants desired per m²					
	240	260	280	300	320	340
15	42	45	49	52	56	59
18	50	54	58	62	67	71

(a) The number of seeds to plant per linear metre is calculated for seed having 85 per cent germination.

Use the Right Herbicide at the Right Time

At the moment, weeds should not create problems in cereals if one refers to the panoply of herbicides which are available on the market. Unfortunately the universal product does not exist, and one must choose the herbicide in relation to the main species to destory. The producer knows his fields well and knows what weeds are found from year to year. What one has to do, therefore, is to have them identified by an agricultural adviser and choose the herbicide which will permit him to get rid of them. The choice of a good product is not sufficient; one must also adhere to the dose and the stage of application recommended. Weeds damage cultivated cereals, and one cannot expect or hope to obtain a good yield if they are not destroyed at the right time. When the weed has reached the blooming stage, it has already done its damage. The producer must spray with the herbicide when the cereals have between three and five leaves.

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tinued from page 14)

es as recommended above.
der no circumstances should
n chemicals or empty containers
eft lying about in fields and
ds.

ple mixing and diluting farm
micals should wear protective
hing, boots, gloves, and goggles,
face shield, according to the
ommendations on the chemical
el. If the chemicals are highly
c substances, impermeable
hing and an appropriate
pirator are a must.

re are three channels of chemic-
osorption: oral, dermal, and
piratory. Oral poisoning is inex-
able: blowing out plugged nozzles,
king or eating without washing
common examples. Dermal absorption of pesticides is the most common route of chemical poisoning and is often not detected until symptoms occur. The inhalation of sprays or dusts poses a serious threat. It can occur where mixing is being done in confined areas or, more commonly, when it is actually being applied.

Everyone who uses chemicals should know and be able to recognize the symptoms of poisoning. The most common signs are headaches, skin irritation, dizziness, weakness, thirst, nausea, trembling, loss of muscle control, excessive salivation, blurring of vision, and many of the actions of an intoxicated person. If any of these symptoms become evident, get medical assistance immediately. Anyone with any of these symptoms should not drive himself to the hospital since mild symptoms of chemical poisoning may become more severe on route. Always take the container and label to the hospital. It can provide valuable information for the doctor. Take note of the Poison Control Centre in your area. For the Provincial Centre at the Centre Hospitalier de l'Université Laval, the telephone number is 418-656-8090. The telephone number for Ste. Justine's Hospital is 514-731-4931 and the Montreal Children's Hospital is 514-937-8511. Both these hospitals are in Montreal.

Acknowledgement for material in this article is made to the Ontario Ministry of the Environment as well as to the Farm Safety Association, Inc., Guelph, Ontario.

This Month with the QWI

Over 50 Years a Member

Mrs. Bernard (Gladys) Holmes, seen here cutting her anniversary cake, was the guest of honour at the February 5 meeting of Ayer's Cliff WI. The occasion was her 53 years as a Stanstead County WI member.

Mrs. Holmes, a registered nurse and native of Montreal, in June 1927 married Bernard Holmes and came to Ways Mills in the County to reside. Her mother-in-law, Mrs. Estelle Holmes, organizer of the County WI and its first President, invited Gladys to accompany her to Ayer's Cliff to attend a County meeting. Thus was Gladys initiated to Women's Institute and shortly after she joined the Way Mills branch. This was dissolved a few years ago because of lack of members, and Gladys joined the Ayer's Cliff branch.

During the years she has given much of herself and her talent to WI at the branch, county, and provincial levels. She served her branch in every office except that of Treasurer, was County President, and Convener of Welfare and Health for the County, and Co-convener at the Provincial level.

In 1941 Gladys was the recipient of a Life Membership and on February 5 the County President Mrs. Rheta Taylor presented her with a 50 year pin. In her remarks of appreciation, Gladys recalled attending meetings in Ayer's Cliff by travelling with horse and buggy. The same mode of transportation was used in Ways Mills if the meeting was held in a home that was beyond walking distance. Her many friends offer her congratulations and thank her for her many years in Institute.

Mrs. Gladys Holmes.

APPLES YEAR ROUND

The following excerpts are from Apples Year Round, the Agriculture Canada publication 1655.

For all-round eating pleasure, Canadians choose apples. Apples make good eating. They combine with just about any food you can name. Served raw or cooked, hot or cold, they add their unique flavour to any meal. They are available in many forms — fresh, canned or dried, and as pie filler, solid pack, sauce or juice. Whether for their sweetness or tartness, apples can be used in many delicious recipes.

Storing

Store baskets or bushels of ripe apples in a dark, well-ventilated, cool room (0°-4°C or 32°-40°F.) Store perforated plastic bags of apples in the crisper of the refrigerator to prevent decay, to slow down ripening and to help maintain quality, juiciness and crispness.

Freeze firm apple varieties that do not brown readily, such as Cortland, Northern Spy, Ida Red and Red Rome Beauty, for pies and puddings. Choose firm, mature apples: wash, peel, core and slice. To prevent discoloration, add 400 mg ascorbic acid in tablet form or 1/8 teaspoon in powdered or crystalline form dissolved in 2 tablespoons cold water to each 2 cups prepared apples . To sweeten, add 2 tablespoons sugar for each 2 cups prepared apples. Mix lightly to coat pieces.

It is not necessary to thaw frozen apples completely to be used in pies, baked puddings or cakes. For pies and puddings, thaw fruit only enough to separate pieces and then proceed as with fresh fruit.

Applesauce prepared in the usual way may be frozen. Thaw and use as fresh or canned.

To rehydrate dried or evaporated apples (if instructions are not included in the recipe), use twice as much boiling water as fruit. Cover and let stand 1 hour at room temperature. Follow recipe instructions for use.

Dried apples may also be rehydrated in a microwave oven. Add 4 cups water to 3 cups dried apples. Microwave 5 minutes on High, stir, then microwave 7 minutes more. Let stand 30 minutes, then follow recipe instructions given for fresh apples.

Apple Metrics

1 large apple yields about 250 mL diced or sliced
250 mL dried apples weigh about 100 g
1 medium apple weighs about 150 g
6 large apples weigh about 1 kg
500 g apples yield about 1 L diced or sliced

1 can (540 mL)* pie filler is sufficient for one 1 L (23 cm) pie
***Metric equivalents are now stated on cans.**

ple Dumplings

try for 2-crust, 9-inch pie
medium apples, peeled and cored
tablespoons butter
cup brown sugar
teaspoon cinnamon
teaspoon salt
cup raisins

l out pastry in a rectangle 1/8 n thick and cut in 6 squares. Set apple on each square and fill ity with mixture of butter, sugar, namon, salt, and raisins. Draw up four corners of pastry and seal es well. Bake at 425°F until try is lightly browned and apples tender (25 to 40 minutes, ending on variety and size of apes). If desired, serve with cream or wn sugar sauce. 6 dumplings.

ked Apples

medium apples
mL butter
mL brown sugar
mL cinnamon
mL water

e apples. Make a cut about 1 cm p around each apple near the to prevent skin splitting during ing; place apples in baking pan. am butter, sugar and cinnamon l fill centres of apples. Add water an. Bake uncovered at 190°C l tender (25 to 50 min — McIn- and similar firm varieties — e 25 to 30 min; Northern Spy l other firmer varieties may take to 50 min). 6 servings.

BAKE APPLES IN A CROWAVE OVEN — Use individual glass custard cups. Add 15 water to each custard cup. rowave on High until tender*.

pple 3- 6 min
pples 4-10 min
pples 6-20 min

aking time depends on variety size of apples. St. Lawrence Lobo require the shortest time ake. McIntosh and Northern Spy uire slightly longer times, and rtan, Red Rome Beauty and wtown require the longest time to e.

Variations — Try the following combinations:

Add raisins, currants, candied ginger, cut peel or chopped nuts to sugar mixture.

Use mincemeat, cranberry sauce or jam in place of sugar mixture.

Top each apple with a marshmallow or a spoonful of meringue, 10 min before baking is completed.

FAMILY LAW

(The following are excerpts from the booklet "An Up-to-Date Family Law" published by the Quebec Ministry of Justice.)

The Civil Code and the Family

A brief word on what the civil code really is would seem to be the best approach to what follows in this booklet. The Civil Code is a general law, comprehensive in that its provisions govern the normal day to day activities of our social life — the interrelationships that obtain between individuals.

So it is, then, that we find in its provisions articles dealing with the rights and obligations of spouses and children, matrimonial regimes, obligation to provide support, etc.

Since 1866, the lives of Québecers have been regulated by the Civil Code, which was initially based on the 1804 Civil Code of France. This code had become more and more outmoded — to the stage where it was no longer equal to the needs of contemporary reality, was no longer in step with the onward progress of Québec society.

A thorough reform of the code was required to make it conform to the aspirations of modern Québecers and, as a first step, family law was redesigned because in this, more than any other subject, the law's out-of-dateness was most keenly felt.

The two principles underlying this reform of family law are:

EQUALITY of man and woman between them and before the law;
FREEDOM of persons in the way they organize their family relations.

Names of spouses

In marriage, each spouse retains his or her name and surname and exercises his or her civil rights under these names (for example, executing a contract, obtaining a driver's permit, credit cards, etc.).

However, a woman married before the new law (before April 2, 1981) came into force has two possibilities open to her:

Either to keep the name of her spouse

In this case, the husband cannot object to the continued use of his name by his wife.

Example[1]:
Rita Murphy married John White in 1970. If she so desires, she may continue to call herself Rita White and exercise her civil rights under that name. If she kept both names, she may continue to use them.

Or to use her maiden name

Example

France Smith married Peter Bentley in 1970. She may return to the use of her own name, France Smith. She need only advise the various administrative bodies concerned to effect the name change on certain documents: driver's permit, health insurance card. etc.

[1]All examples used in this booklet are fictitious and names and surnames chose at random.

The family residence

A Declaration of Family Residence involving an immoveable property owned by one of the spouses can be made by one or the other or both of them by means of a form available at the registry office in the district where the immoveable property is located. In this case, the presence of two witnesses is necessary, and the costs are minimal (approximately $8). The declaration can also be made and registered by a notary or a lawyer. Besides registration costs, certain fees are payable.

Separation as to property

The spouses may choose to be separate as to property by a con-

tract of marriage. It may also be applied for the court by one of them as a means of protection where the parties have been married subject to the partnership of acquests or community of property.

The separation as to property works in the same way as the partnership of acquests except that, under the former, either spouse can give away his or her private property without the other's consent.

Under the new code, absolute separation as to property no longer exists because of the new provisions relating to the family residence.

Dear WI Members:

Waterloo-Warden's conveners were very active. Agriculture gave a recipe for dessert using cream. Citizenship told of a man who was going to reunite a young girl with her mother, whom she scarcely knew. Education reported on a project being carried out by young people of 17-21 on a voluntary basis. They receive a small fee from the Federal government. Welfare and Health read the account of a WI meeting in Alberta with a very similar agenda to ours. Economics conducted a contest. Names of spices were given in French which were to be translated to English. Three prizes were given.

During the meeting at **Abbotsford** little notes of local interest were written and enclosed in an envelope to be sent to a former member now residing in the Wales Home to help cheer her up on those cold wintery days. It was also reported that three members called on a sick member celebrating her 91st birthday. They took a decorated cake with them. The President read the résumé taken from the Winter 1977 issue of Federated News of the first Women's Institute being formed at Stoney Creek in Ontario by Mrs. Adelaide Hoodless with the help of Erland Lee, a local prominent broad-minded and public-spirited young farmer. From this first meeting it was not long before it spread across the country and today we are known world-wide in over 70 countries through the Associated Country Women of the World, having several million members. This refreshed our memories and gave more meaning of why we are members of this great organization.

Granby Hill's members agreed at their February meeting that, in spite of the troubles we have here in Quebec, we are still better off than anywhere else. Of course, we were all born around the area, enjoy visiting other areas, but think we prefer to continue living here. There are big cities nearby and we can travel into the U.S. very easily. We have the variety in the weather — not always agreeable — but we do have the conveniences to cope with it. Handicrafts were brought in by the members and two of them chosen to be sent to FWIC at Fredericton for the sales table. — The Sick and Shut-in Convener Mrs. McCutcheon took a nice potted plant to Mrs. Ossington, one of the members who has been unable to attend meetings for several years. Her interest in WI continues. The Agriculture Convener explained "Gone with the Wind" is what is happening to the top soil on the prairies and in other areas. Citizenship Convener read an article about the Founding of the W.I. and another report from "Do you know". — Education said that adults often swap skills. Reverend George Campbell III, an asistant minister, teaches some French cuisine. — Welfare and Health mentioned that "Ignorance is bliss", a short poem read. She spoke of the closing of departments in several hospitals. Compared this loss of necessary departments with the purchase of marble toilets and other renovations (outlandish) to Quebec parliament buildings. — Home Economic Convener reported that the flavour of onions in salads can be modified by chopping and boiling them for just a few minutes before using them. Left over celery can be chopped with an onion and cooked to make a freezer item for future use in stuffing or soups.

Belvidere members saw slides, shown by Mrs. Doris Conley, of a bus tour of India.

Brompton Road made cash donations to the Heart Fund and the ACWW Flag Tour Fund. In their program they held a decorated cupcake contest with prizes going to Mrs. Eunice Brown and Mrs. Myrtle Sage. The judges were Mrs. Margaret Nadeau and Mrs. Annie Goodfellow. The cupcakes were auctioned off, the proceeds going to the ACWW Flag Tour Fund. — Mrs. Annie Goodfellow, Publicity Convener, donated two crocheted doilies, one for the Flag Tour Fund, the other for the sales table at Macdonald College in June.

Ascot branch entertained all branches of Sherbrooke County at a dinner in honor of Founder's Day. This delicious luncheon was enjoyed by approximately seventy members and guests. The head table was centred by a beautiful anniversary cake made by Mrs. Harold Robertson. The cake was iced in white and decorated in the WI colours of blue and gold.

Lennoxville's motto: Teach the young people how to think, not what to think. Financial support was given to the Special Winter Olympics for the handicapped, which was held in Lennoxville, and to the Scholarship and Bursary Fund of the Alexander Galt Regional High School. — Members helped in setting up a window display of W.I. work in observance of the Institute Week and Founder's Day. In keeping with the 125th birthday of Mrs. Hoodless and the founding of the W.I. 85 years ago, slides of the Hoodless Homestead were shown to members and their guests, and to the Education and Publicity Conveners from other branches in the county.

Wright branch said in its motto: "There are no uninterested things. There are only uninterested people" and the members were asked in the Roll Call to bring one item of good news from a newspaper or magazine. Mrs. H. Payne gave a short talk on a project by the Ontario Ministry of Food and Agriculture called "Agricrews", where students are hired to do odd jobs on farms where needed, such as painting barns, building fences, making hay, gardening, etc. Cindy, a neighbour's daughter of Mrs. Payne, who worked with this project said it was hard work yet she felt a healthy out door summer job with pay is worth it.

Ruth von Brentani,
QWI Publicity Convener

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